

The Psychology of Scarcity: How Limited Availability Influences Consumer Willingness to Pay

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Abstract - Scarcity has been used in selling for a very long time, yet its effect on what consumers are actually willing to pay remains less clear than its widespread use would suggest. Retailers announce that only three rooms remain, luxury houses keep waiting lists for goods they could make in greater numbers, and sneaker brands release a few thousand pairs knowing that many times that number of people will want them. The shared assumption is that limited availability makes people willing to pay more. This paper looks more closely at what the behavioural and consumer literature can actually support about that assumption. Drawing on commodity theory, reactance, prospect theory, signalling models and work on attention under scarcity, I set out five mechanisms through which scarcity can raise willingness to pay: quality inference, uniqueness seeking, competitive arousal, loss aversion and attentional narrowing. I then argue that the effect is conditional rather than universal. The source of scarcity, its credibility, the kind of product, the consumer's own motives and the measurement method all change the size of the premium, and sometimes reverse its sign. The paper closes with five testable propositions, a proposed experimental design using incentive-compatible elicitation, a discussion of the ethics and regulation of manufactured scarcity, and implications for pricing practice.

Keywords: scarcity, willingness to pay, behavioural economics, consumer psychology, commodity theory, pricing

1. INTRODUCTION

In the weeks before Diwali, Indian e-commerce platforms routinely use countdown clocks, stock meters and banners announcing that a deal ends at midnight or that only a handful of units remain. Nobody running these campaigns seems to doubt that the messages work. Marketing teams reuse them, shoppers recognise them, and many of us, if we are honest, have clicked "buy" a little faster because of them. Yet the claim that scarcity makes people pay more is really several claims bundled together, and they do not all hold with equal force.

The first claim is about wanting: scarce goods are desired more. The second is about judgement: scarce goods are believed to be worth more. The third is about money: consumers will actually hand over a higher price. These are related but separable. A person can crave a limited-edition watch and still refuse the asking price. Someone else can rush to buy a discounted phone because stock is running low without believing the phone is worth a rupee more than it was yesterday. Willingness to pay (WTP), the maximum price a consumer would accept for a good, sits at the end of this chain. It is the quantity that matters most for pricing decisions, and it is also the hardest of the three to observe cleanly.

Research on scarcity is neither new nor small. Brock (1968) proposed commodity theory in the late 1960s, arguing that anything unavailable becomes more valuable to the person who cannot easily obtain it. Cialdini (2009) later carried the idea well beyond academia by listing scarcity among his principles of influence. Lynn (1991) gathered a long run of experiments into a quantitative review and concluded that scarcity does tend to raise perceived value. Since then the field has spread in several directions at once. Some researchers ask why scarcity works, others ask when it fails, and a third group, following Mullainathan and Shafir (2013), study what scarcity does to the minds of people who truly lack resources, as opposed to people who merely see a "limited stock" label.

One issue receives less attention than it probably deserves: the money question itself. A large share of scarcity studies measure attractiveness ratings, purchase intentions or choice shares. Those outcomes are informative, but they are not prices. Ticking a high number on a rating scale costs nothing; a bid has to be paid, and the two often come apart. And a firm setting a price needs to know things the ratings never tell it. How big is the premium? Does it last? What happens to trust once customers find out the shortage was staged?

The paper therefore has four main aims. The first is to lay out the theoretical foundations of scarcity effects and show where they come from. The second is to identify the psychological mechanisms through which scarcity could raise WTP, and to keep them apart, because they make different predictions. The third is to map the conditions under which the effect weakens or reverses. The

fourth is to offer a set of propositions and a research design that future work could use to test them with incentive-compatible methods. Some of my interest in this comes from Mumbai property, where "last few units" is close to a house style, and I say so now because it colours which questions seemed worth asking. The argument itself leans on published work, not on what I have seen across a sales-office table.

There is also a boundary to the discussion. The paper concerns consumer goods and services bought by individuals. It does not cover industrial procurement, nor commodity markets, where scarcity means something quite different. I use "scarcity" in the marketing sense, as perceived or actual limits on the quantity or the time in which a product can be obtained, and "resource scarcity" for the broader condition of having too little money, time or food. The two are connected, and I return to the link in Section 3.

2. THEORETICAL FOUNDATIONS

2.1 Commodity theory and the value of the unavailable

Brock (1968) defined a commodity broadly. It is anything that is useful to its owner, that can be transferred from one person to another, and that might not be available to everyone. Value, he argued, rises with unavailability. The reasoning was not elaborate. If something is difficult to get, then having it sets you apart, and the thing itself begins to look better than its plain features would justify. Brock also said that the effect should be stronger when the commodity is something people cannot easily replace and when the scarcity is not attributed to a trivial cause such as a clerical error.

The earliest experiments were small and almost playful. In a well-known study, Worchel, Lee and Adewole (1975) put chocolate-chip cookies in glass jars, some holding ten cookies and others holding two. Participants rated the cookies from the near-empty jar as more desirable and said they would pay more for them. A second twist mattered even more. Cookies that started out plentiful and then became scarce, because the jar was supposedly depleted by other participants, were rated higher than cookies that had been scarce from the beginning. The authors read this as evidence that a recent drop in availability, together with the suggestion that other people want the item, adds something that static scarcity does not.

Lynn (1991) reviewed the commodity-theory literature quantitatively and found that scarcity generally raised perceived value and desirability. He also found that the size of the effect varied by how scarcity was manipulated and by what outcome was measured, a point that comes up repeatedly in the discussion that follows. A year later Lynn (1992) argued that naive economic theories do much of the work: people carry around a lay belief that scarce things are expensive and therefore good, and they apply it automatically. This is a useful way to think about the phenomenon because it explains why scarcity cues can raise price estimates even when the shopper cannot say what is special about the product.

2.2 Reactance and the loss of freedom

A second foundation comes from Brehm's (1966) theory of psychological reactance. When people feel that a freedom they believed they had is being taken away or threatened, they become motivated to restore it, and one common way of doing so is to find the blocked option more attractive. A "limit of two per customer" sign works in this way. It does not just describe the world, it narrows the buyer's choices, and the narrowing can provoke an urge to push against it.

The applied evidence is mixed, and that is useful rather than inconvenient. Inman, Peter and Raghurir (1997) found that purchase limits on promotional items led shoppers to buy more units, which is hard to explain through bargain-hunting alone, since the limit makes the deal less generous in principle. One account is that the limit signals that the deal is a good one. Another is that it triggers reactance. The two accounts are not exclusive, and field data rarely allow them to be pulled apart.

Reactance has a built-in weakness as an explanation for premium pricing. It requires the person to believe that the restriction is aimed at them, or at least that it is a real restriction. If the limit looks arbitrary or manipulative, the reactance may be directed at the seller rather than at the product, and willingness to pay falls. That possibility will matter in Section 6.

2.3 Prospect theory, loss aversion and the endowment effect

Prospect theory (Kahneman & Tversky, 1979) holds that people evaluate outcomes as gains or losses relative to a reference point, and that losses loom larger than gains of the same size. Tversky and Kahneman (1991) extended the idea to riskless choice, showing that giving up a good is felt more sharply than acquiring an equivalent one. The endowment effect, documented by Kahneman, Knetsch and Thaler (1990) in experiments where mug owners demanded far more to sell their mugs than non-owners were willing to pay for them, is a close relative.

Scarcity connects to this framework through the reference point. Once a shopper has put an item in a basket, imagined using it, or read that it is almost sold out, the item can begin to feel like it already belongs to them. Failing to complete the purchase is then coded as a loss, not as the absence of a gain. Because the loss is judged more heavily than the gain, the shopper's maximum acceptable price drifts upward. The endowment effect is conditional, and later research shows that it weakens for goods held for exchange and for experienced traders. Loss aversion is therefore better treated as one mechanism among several rather than as a complete explanation.

2.4 Price, status and signalling

A purely economic account can explain a good deal of what looks like psychology. When supply is restricted and demand is not, price rises. Nothing about human cognition needs to be invoked. What makes scarcity a topic for psychologists is that the relationship between availability and price also runs through beliefs and social meaning.

Veblen (1899) described conspicuous consumption, in which goods are bought partly because they cost a lot and thereby display wealth. Leibenstein (1950) formalised three related phenomena. The bandwagon effect describes demand that rises because others are buying, the snob effect describes demand that falls as a good becomes common, and the Veblen effect describes demand that rises with price itself. Amaldoss and Jain (2005) showed formally how firms selling to consumers with snob and conformity motives can set prices that would look irrational under standard demand assumptions.

Signalling models provide a bridge. Stock and Balachander (2005) argued that sellers may deliberately keep supply below demand, creating "hot products," because consumers cannot observe quality directly and read shortages as evidence that many other buyers have judged the product favourably. For this to be a credible signal, in their analysis, it must cost the seller something, and it works best when the seller really does have a better product. That is a useful discipline on the debate. If every seller can fake scarcity at no cost, the signal ought to lose its meaning over time, and there is reason to suspect that it does.

2.5 What the four strands do and do not explain

The four strands become easier to distinguish when we ask what each one explains particularly well. Commodity theory accounts for why unavailability adds anything at all. Reactance is mainly about motivation, the push to get what has been blocked. Prospect theory deals with what the prospect of losing out does to judgement, and the status literature explains why certain goods and certain buyers react more than others. None of them, alone, predicts a stable price premium. Put together they suggest several channels that sometimes pull the same way and sometimes don't, and that leads into the next section.

3. PSYCHOLOGICAL MECHANISMS LINKING SCARCITY TO WILLINGNESS TO PAY

I count five mechanisms. They are not neatly independent, and a reader could reasonably merge two or split a third, but treating them separately pays off because each predicts a somewhat different pattern of results, and a firm should know which one it is pulling on.

3.1 Quality inference

One of the simplest explanations is a heuristic: if few are available, others must have wanted them, and others are probably right. Cialdini (2009) called this the scarcity heuristic and linked it to social proof. The shopper does not evaluate the product directly. She evaluates the crowd's apparent verdict, which is cheaper to process and often serves well.

Verhallen and Robben (1994) found experimentally that unavailability could raise product evaluations, and that the reason for the unavailability shaped the result. Gierl and Huettl (2010) went further and showed that the benefit of scarcity depends on why the product is scarce and what kind of product it is. In their studies, scarcity attributed to high demand worked as a quality cue, particularly for products consumed in public view, while scarcity attributed to limited supply did not always do so. That pattern is consistent with the quality-inference explanation. When the shortage is read as the result of other people's choices, it carries information about quality. When it is read as a production constraint, it carries much less.

For WTP the implication is direct. If the premium comes from inferred quality, it should shrink when the consumer has other ways of judging quality, such as reviews, a trial, a warranty or personal experience. It should be largest for experience goods and for novel products where reliable information is hard to find.

3.2 Uniqueness and status

A second route works through identity and distinctiveness. Snyder and Fromkin (1980) argued that people have a motive to see themselves as distinct from others, and that they take steps to restore that distinctiveness when it is threatened. Tian, Bearden and

Hunter (2001) turned the idea into a measurable trait, consumers' need for uniqueness, and showed that it predicts attraction to rare or novel products.

Limited editions, numbered releases and waiting lists draw on this motive almost by design. The scarcity is not just a signal about the product. It is a promise about the owner. The buyer is not paying for the object alone but for the ability to say, truthfully, that few others have it. This is the mechanism that connects most naturally to Veblen and Leibenstein, and it explains why the same unit of scarcity can raise WTP a lot for a handbag and very little for a kitchen appliance.

The uniqueness mechanism has two features worth stating plainly. First, it depends on the good being visible or at least describable to others. Second, it can reverse. If a scarce good becomes widely owned, the snob effect described by Leibenstein (1950) takes over and the premium collapses. Van Herpen, Pieters and Zeelenberg (2005) reported evidence that scarcity can produce both snob-type and bandwagon-type preferences depending on how consumers interpret the reason for it, which is a reminder that the same cue can push in different directions.

3.3 Competitive arousal

The third mechanism is social, but it works somewhat differently. Limited quantity does not just tell you the product is good or the owners are special. It tells you that other buyers are your rivals. Aggarwal, Jun and Huh (2011) found that limited-quantity messages were more persuasive than limited-time messages, and argued that the reason is that a quantity limit activates a competitive mindset: someone else may get it first. Time limits, by contrast, set the consumer against the clock, not against other people.

Competitive arousal is well known from auctions. Ku, Malhotra and Murnighan (2005) described "auction fever," in which rivalry and time pressure lead bidders to pay more than they planned, sometimes more than the item's price elsewhere. Scarcity promotions can generate a milder version of the same state. Kristofferson, McFerran, Morales and Dahl (2017) went so far as to show that exposure to limited-quantity promotions can heighten aggressive behaviour, so strongly can the rivalry frame take hold.

This explanation also gives us a fairly clear prediction to test. The premium should rise when the consumer is aware of other shoppers, through live counters, visible queues or notifications that others are viewing the same item, and it should fall when the choice is made in private. It should also depend on the consumer's competitiveness as a trait.

3.4 Loss aversion and anticipated regret

The fourth mechanism follows from the loss-aversion argument discussed earlier. Once the possibility of missing out is salient, the consumer imagines the regret of not having bought. Because regret is anticipated more intensely than the pleasure of a modest saving, the consumer leans toward buying, and tolerates a higher price to do so.

This channel is closely tied to time. Anticipated regret is greatest at the moment a decision is about to be made and fades afterwards, which is why scarcity cues are usually placed at the point of purchase. It also helps explain why consumers sometimes feel dissatisfaction after the fact. The regret that motivated the purchase is no longer present, but the price is.

There is a further prediction here. If loss aversion is the main channel, then framing should matter. A message saying "only two left" and one saying "ninety-eight percent sold" describe the same inventory but invite different reference points. I am not aware of a clean field test that compares the two with real payments, and that is a gap.

3.5 Attentional narrowing and the cognition of scarcity

The fifth mechanism comes from a different body of research, namely work on how people think when resources are scarce. Shah, Mullainathan and Shafir (2012) found that scarcity captures attention. People facing a shortage of money, time or something else they value focus on the shortage and neglect other matters, a pattern the authors described as tunnelling. Mani, Mullainathan, Shafir and Zhao (2013) reported that thinking about financial difficulties reduced performance on cognitive tasks, an effect they attributed to a drain on mental bandwidth.

For consumers, narrowing implies that a salient scarcity cue can pull attention toward the single dimension of the choice that the cue highlights, namely whether the item will still be available. Other dimensions, such as price relative to competing offers, receive less processing. Suri, Kohli and Monroe (2007) reported that perceived scarcity changed how consumers processed price information. If this is right, then part of the premium under scarcity is not a revised valuation at all. It is a reduction in the scrutiny that normally keeps consumers from overpaying.

The link to resource scarcity deserves care, because the direction of effects is not obvious. Shah, Shafir and Mullainathan (2015) showed that scarcity makes people attend more to trade-offs and to the value of money, and in that sense the poor can be more careful buyers than the well-off. Roux, Goldsmith and Bonezzi (2015) reported that reminders of resource scarcity promoted a more competitive and self-interested orientation. So the consumer who feels short of resources and also faces a "limited stock" label is being pulled in two directions: toward wariness about price and toward urgency about supply. This interaction may help explain why field results for scarcity promotions differ across income groups, although the available evidence does not isolate the mechanism cleanly.

Attentional narrowing is often invoked to explain scarcity effects, although its role in explaining price premiums has received much less direct testing. It may explain why people buy quickly without necessarily explaining why they pay more.

Not every result in this research programme has held up easily. Wicherts and Scholten (2013) questioned the analysis behind the cognitive-function finding, and the broader replication debate in psychology, including the large-scale replication effort reported by the Open Science Collaboration (2015), is a reminder to treat any single effect size with some distance.

3.6 An integrated view

Figure 1 sets out the five mechanisms and where they connect to the final price a consumer is prepared to pay. The diagram is conceptual, not empirical. Its purpose is to show that the channels are different, that they depend on different features of the situation, and that moderators of the kind discussed in Section 6 can alter each one independently.

Figure 1. Conceptual model of the five mechanisms linking scarcity cues to willingness to pay. Illustrative framework, not empirical data.

A cue that switches on several channels together, say a luxury item with a numbered run, a public waiting list and a live counter, should do more than a cue that switches on one. A flashing "last chance" banner on a commodity product may touch only the attentional channel, and the likely result is more orders at the same price, not orders at a higher one. That difference, between selling more and selling dearer, runs through the rest of the paper.

4. FORMS OF SCARCITY

Scarcity is not a single type of stimulus. It comes in several forms, and the consumer research suggests that they differ in how they work and in how much premium they can support.

4.1 Limited quantity and limited time

The distinction most often drawn in advertising research is between limited-quantity and limited-time scarcity. Aggarwal et al. (2011) found limited-quantity appeals to be the more effective of the two, and attributed the difference to competition. Quantity limits say that someone else may take what you want, and time limits say only that the opportunity will end.

From the standpoint of willingness to pay, the difference can be important. A time limit is typically attached to a promotion, which means that it implies a lower price for a short period. It may therefore raise purchases without raising WTP, because the consumer anchors on the discounted price and treats the deadline as the reason to act now. A quantity limit may attach to a premium product and imply that the price will not fall. It is consequently more likely to bear on valuation itself. This should be treated as a hypothesis rather than an established finding, and I include it among the propositions in Section 8.

4.2 Demand-driven and supply-driven scarcity

Section 3.1 introduced the distinction between shortages caused by popular demand and shortages caused by restricted supply. Verhallen and Robben (1994) and Gierl and Huettl (2010) both found that the reason for scarcity mattered. Demand-driven scarcity ("selling fast") conveys that other people want the item, so it is a social signal. Supply-driven scarcity ("limited production") conveys exclusivity but not necessarily popularity.

Ad copy uses the two interchangeably, and the research says they are not the same thing. The first leans on quality inference and competitive arousal; the second on uniqueness. So the wording ought to follow the motive of the target buyer. "Selling fast" probably does more for a mass-market gadget, "edition of five hundred" for a design object. This remains a tentative interpretation because a direct head-to-head test is not available here.

4.3 Natural, deliberate and fabricated scarcity

A shortage can be real and unplanned, as when a harvest fails. It can be real and planned, as when a house releases a fixed number of pieces. Or it can be fabricated, as when a website shows "only two left" for an item that is plentifully stocked. Consumers rarely know which of the three they are looking at, and their inferences depend on their assessment.

Stock and Balachander (2005) argued that deliberate scarcity can serve as a credible signal because it carries a cost. If the firm limits supply and could have sold more at the same price, it has given up revenue to make the point. Fabricated scarcity costs nothing, which is exactly why it should be less credible. Evidence from online retail suggests the practice is widespread. Mathur, Acar, Friedman, Lucherini, Mayer, Chetty and Narayanan (2019) crawled a large number of shopping websites and found many that used scarcity and urgency messages, some of which appeared to be generated without reference to actual inventory.

4.4 Product scarcity and resource scarcity

Finally there is the distinction already drawn between scarcity of the product and scarcity of the consumer's own resources. Cannon, Goldsmith and Roux (2019) proposed a self-regulatory model of resource scarcity in consumption, treating scarcity as something that shifts goals and the way consumers allocate effort. Hamilton, Thompson, Bone and colleagues (2019) reviewed how scarcity affects each stage of the consumer decision journey. Two cautions seem particularly important here. First, the two forms of scarcity can interact. Second, the evidence base on resource scarcity is built largely on samples that may not match the shoppers who respond to product scarcity cues.

Table 1 collects a selection of the studies discussed above and the findings that bear most directly on valuation.

Table 1. Selected studies on scarcity and valuation

5. MEASURING WILLINGNESS TO PAY UNDER SCARCITY

The way WTP is measured can materially change the result, an issue that deserves greater attention in scarcity research.

Stated-preference methods ask people what they would pay. They are cheap and flexible, and they allow researchers to test many conditions quickly. Their weakness is hypothetical bias. In a meta-analysis of stated-preference valuation studies, Murphy, Allen, Stevens and Weatherhead (2005) found that hypothetical values tended to exceed real ones by a considerable margin. If scarcity cues inflate the sense of urgency and desirability, then hypothetical measures may exaggerate the effect even more than they exaggerate WTP in general, since the respondent faces no real competition for the product and no real cost.

Incentive-compatible methods link the respondent's answer to a real transaction. The Becker-DeGroot-Marschak procedure (Becker, DeGroot & Marschak, 1964) asks the participant to state a price and then draws a random price; if the draw is below the stated amount, the participant buys at the drawn price. Because the price paid does not depend on the stated amount, truthful reporting is the best strategy. The second-price auction of Vickrey (1961) has a similar logic. Miller, Hofstetter, Krohmer and Zhang (2011) compared several approaches and found that incentive-aligned methods outperformed hypothetical ones in predicting real purchases. Breidert, Hahsler and Reutterer (2006) provide a broader survey of the options, including conjoint analysis and price-sensitivity meters.

Scarcity creates special difficulties for these methods. In a BDM procedure, the participant knows that the product is available at the drawn price, so there is no real scarcity. The consumer can say how much they value the item, but not how much they value it when others may take it first. In a multi-bidder auction, scarcity can be built in by limiting the number of units relative to bidders, but then competitive arousal enters, and it cannot be separated easily from the other channels. No single method isolates each mechanism, so I think a combination is needed, and Section 8 sketches one. Premiums measured with real money may also prove smaller than headline estimates based on hypothetical measures, although this remains an empirical question.

A further issue is the arbitrariness of WTP. Ariely, Loewenstein and Prelec (2003) showed that stated valuations can be strongly shaped by irrelevant anchors while still being coherent across related goods. Scarcity cues may function partly as anchors, so that a measured premium reflects a shift in the arbitrary starting point and not a durable change in preference. Whether such a premium persists after the cue is removed, which would indicate a real valuation change, is something very few studies check.

6. MODERATORS AND BOUNDARY CONDITIONS

If scarcity always raised WTP, the field would be simpler and probably less interesting. A good deal of the literature is about what limits the effect.

6.1 Consumer characteristics

Need for uniqueness (Tian et al., 2001) is the best-established moderator. Consumers high on the trait respond more to scarcity of products that offer distinctiveness. A parallel prediction can be made for the competitive trait and the competitive arousal mechanism, though evidence is thinner. Knowledge and experience matter as well. A consumer who knows the product category well has independent means of judging quality and will lean less on the scarcity heuristic. A first-time buyer, say of a car or an apartment, has fewer such resources and may lean more heavily on cues of any kind.

Persuasion knowledge is also relevant. Friestad and Wright (1994) argued that consumers develop beliefs about the tactics marketers use and about how those tactics work, and that these beliefs change how they respond to a persuasion attempt. A shopper who has seen many "only three left" banners and suspects they are fictitious will discount them. Eisend (2008) found that the effectiveness of scarcity appeals in advertising depended on consumers' perceptions of their susceptibility, which is consistent with this idea.

6.2 Product characteristics

The product category shapes the effect in several ways. Visibility matters for uniqueness and status, as already noted. The Gierl and Huettl (2010) results suggest that conspicuously consumed goods benefit more from demand-driven scarcity. Whether the purchase is hedonic or utilitarian may matter too, though the evidence on this point is less settled than textbook treatments sometimes suggest. Hedonic goods give more room for symbolic value to attach, while utilitarian goods are judged more on function, where price comparison is easy. Experience goods, whose quality is hard to judge before use, leave more room for scarcity to serve as a quality cue than search goods do.

Price level matters as well. For low-priced items the cost of being wrong is small, and a scarcity cue may easily push a purchase through. For high-priced items such as property, consumers tend to deliberate longer and seek additional information, and a cue that works on a snack may produce suspicion on an apartment. I return to this in Section 7.

6.3 Credibility and context

Credibility is perhaps the most practically important moderator. A cue is useful only if the consumer believes it. Brock (1968) already noted that scarcity attributed to a trivial or arbitrary cause should not enhance value. Credibility is raised when the source is trusted, when the information is verifiable, and when the cue is consistent with other things the consumer knows. It is lowered by repeated exposure to cues that turn out to be empty, and by the plain suspicion that the seller benefits from the belief.

One cost of widespread fabricated scarcity is therefore an erosion of credibility for everyone, honest sellers included. The signalling logic of Stock and Balachander (2005) would predict this. If a signal becomes cheap, its value as evidence declines. A market flooded with false urgency messages should produce shoppers who ignore them, or who read them as a warning sign.

6.4 Culture and social setting

Evidence on cultural differences is thin. Individualism-collectivism theory would predict that uniqueness-driven scarcity works better where independence is prized and bandwagon-type scarcity where fitting in is. This remains an open empirical question. In India, where family and peer approval often weigh heavily on large purchases, I can build the argument in both directions: a limited edition as a mark of distinction, or "selling fast" as proof that the community approves. Cross-country comparisons would settle more than my speculation can.

7. SCARCITY IN PRACTICE: MARKETS, MARKETING AND ETHICS

7.1 Luxury and limited releases

Luxury goods are the clearest case of deliberate scarcity. Waiting lists for certain handbags, numbered watch editions and restricted-access product drops are all examples of a seller limiting availability when more could in principle be produced and sold. Such a practice fits the signalling account closely. The cost is real, since sales are forgone, and the benefit is the preservation of exclusivity, which supports price. It also fits the uniqueness mechanism, since much of what the buyer pays for is the knowledge that few others own the item.

A trade-off appears over time. Scarcity maintained for years builds a reputation for exclusivity, but it also builds resentment among customers who feel excluded, and it can encourage resale markets in which the price is set by someone other than the maker. Whether the brand benefits from the secondary market's high prices, as a sign of demand, or loses from them, as lost revenue, is an open question that I suspect varies from case to case.

7.2 E-commerce, flash sales and booking sites

Online retail has made scarcity cues cheap to produce and easy to test. Stock counters, countdown timers and "others are viewing this" notifications can be shown or hidden with a line of code, and platforms can run experiments at scale. This has also brought regulatory attention. The UK Competition and Markets Authority took action in 2019 against online hotel booking sites over pressure-selling claims, such as statements about how many rooms remained or how many other people were looking. Mathur et al. (2019), mentioned above, catalogued scarcity and urgency messages among a group of what they called dark patterns.

In India, the Department of Consumer Affairs (2023) issued guidelines on the prevention and regulation of dark patterns, and these list false urgency among the practices to be avoided, including claims about scarcity that do not reflect real stock. The existence of such rules matters for researchers as much as for firms. It means that studies of scarcity cues in field settings will increasingly have to distinguish between honest and misleading uses, and that consumers' learned responses may be changing as the law changes.

7.3 Real estate

I have spent much of my professional life around real estate, and I think the property market offers a useful, if awkward, test case. Developers routinely describe launches in terms of limited inventory. "Only a few units left" in a tower, "pre-launch pricing for the first fifty bookings," and a price schedule that rises with each floor or phase are all familiar. Property is a high-involvement purchase, usually the largest a family will make, and buyers usually deliberate for weeks or months and consult relatives, brokers and friends.

Several of the mechanisms above apply in unusual forms. Quality inference operates through the behaviour of other buyers: a project where units are visibly selling is read as a good project. Competitive arousal appears when buyers are told, truthfully or not, that others have shown interest in the same unit. Loss aversion is strong, since buyers know that prices in a rising market may not return to today's level. At the same time, attentional narrowing is limited by the sheer amount of due diligence involved, and persuasion knowledge is high, since buyers are used to being sold to.

A particularly important feature of the property market is the asymmetry of information. A buyer cannot independently verify how many units are really unsold, and the developer knows. That makes the credibility of scarcity claims depend heavily on reputation and, in India, on the transparency requirements of the real-estate regulatory framework. Buyers also appear increasingly sceptical of vague scarcity claims, while developers that publish verifiable inventory may have an advantage. This observation would benefit from systematic testing.

7.4 Ethical considerations

The practical discussion also raises an ethical question. When scarcity is real and honestly communicated, it conveys useful information and I see no ethical problem. When it is fabricated, it exploits a heuristic that works only if signals are honest, and it does so for the seller's benefit at the buyer's expense. The consumer pays more, or buys sooner, on false pretences. Beyond the individual harm, there is a collective cost to the information environment, as noted in Section 6.3.

A middle category is harder. A firm may restrict supply deliberately, which is real, but present the restriction as the result of overwhelming demand, which may not be. Or a firm may use a scarcity cue accurately but at a moment designed to cut short the consumer's deliberation. The distinction is not always clear. One useful test is whether the claim would remain acceptable if the consumer knew exactly how it had been generated. If a buyer learned exactly how the number "three left" was produced, would they feel misled? If so, the practice is probably on the wrong side.

8. PROPOSITIONS AND A PROPOSED RESEARCH DESIGN

8.1 Propositions

The argument so far can be condensed into five propositions. Each is stated so that it could be falsified.

P1. Scarcity raises incentive-compatible WTP, but by less than it raises stated purchase intention. The premium measured with real money should be smaller than the premium measured on rating scales, because the latter omit the cost of being wrong.

P2. Demand-driven scarcity raises WTP more than supply-driven scarcity for products consumed in public view, and the pattern reverses for products consumed in private. This follows from the distinction between quality inference and competitive arousal on the one hand and uniqueness on the other.

P3. The WTP premium from limited-quantity cues exceeds the premium from limited-time cues when the product is offered at a list price, but not when it is offered at a discount. The reasoning is that time limits mostly accelerate decisions on discounted offers, while quantity limits bear on valuation.

P4. Credibility moderates the effect: the premium shrinks as consumers' suspicion that the cue is fabricated rises, and can turn negative at high levels of suspicion. This is the backlash prediction.

P5. A substantial part of the measured premium disappears when the scarcity cue is removed before the final price is stated. If the premium comes from attentional narrowing or anchoring, it should not persist, whereas premiums from quality inference or uniqueness should persist at least partly.

8.2 Proposed design

No single experiment can test all five propositions adequately. A programme of three complementary experiments would provide a more useful test.

Study 1: lab auction and BDM comparison. Participants would be recruited as consumers of a moderately priced, visible product category, such as headphones or a branded backpack, to allow for status effects. A between-subjects design would cross scarcity (none, limited quantity, limited time) with source (demand-driven, supply-driven). Each participant would state WTP in a BDM procedure with a real purchase possibility. A parallel group would answer the same question hypothetically. This would test P1, P2 and P3. For the BDM condition, scarcity could be made real by telling participants that the product is limited in the session and that units go to participants in order of the randomly drawn price, which creates a form of competition within the BDM logic.

Study 2: credibility manipulation. Participants would see the same scarcity cues, preceded by information that varies how reliable the cues are, for instance by describing the seller as having previously been found to display accurate or inaccurate inventory counts. WTP would be measured as in Study 1. This would test P4. A measure of persuasion knowledge, following Friestad and Wright (1994), would be collected to examine whether it mediates.

Study 3: persistence. Participants would first state WTP under a scarcity cue, then be informed that the cue no longer applies, and state WTP again after a delay. Differences between the two would test P5. A comparison with a control group never exposed to the cue would allow estimation of the anchoring component.

Sample sizes should be determined in advance using realistic effect sizes. Since the scarcity literature includes effects that vary widely, I would plan on the conservative side and pre-register hypotheses, analyses and exclusion rules. Field validation would be desirable, ideally in cooperation with a retailer that can vary the cues for real customers with a transparent consent process.

9. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are several limitations that should not be overlooked. This is a synthesis, with no new data. The propositions are reasoned from earlier studies, and many of those used hypothetical outcomes, student samples or Western participants. My remarks on the property market come from one practitioner in one city, so they are hypotheses.

The literature itself has features that call for humility. Effects documented in one setting have not always replicated in another, and the broader replication discussion in psychology (Open Science Collaboration, 2015) applies to consumer research as well. Publication bias may overstate scarcity effects, since studies that find an effect are easier to publish than studies that do not. The meta-analytic evidence reported by Lynn (1991) is now several decades old, and the retail environment has changed enormously since then.

Several directions seem especially worth pursuing. The first is longitudinal. Almost nothing is known about what happens to a consumer's trust and WTP across repeated exposures to scarcity cues, particularly after discovering that one was false. The second is cross-cultural: careful comparisons between countries and between income groups are needed, including emerging markets where much of the growth in e-commerce is now occurring. The third is the interaction between product scarcity and resource scarcity, which I argued in Section 3.5 may pull consumers in opposite directions. The fourth is the measurement of premiums with real payments in field settings, since the gap between lab and field is the biggest uncertainty in the whole area. The fifth is regulatory: as rules on false urgency take effect in more jurisdictions, researchers have an opportunity to study natural experiments in which scarcity claims were restricted.

10. IMPLICATIONS FOR PRACTICE

These implications come from a conceptual analysis, not a field trial, so I offer them as working guidance.

The first thing a firm should settle is what a scarcity cue is for. A countdown timer that speeds up purchase of a discounted product has a different job from a "limited run" label meant to hold a premium price, and treating the two alike leads to disappointment. If volume rises after a timer goes up but margin falls, the cue has probably worked on urgency and not on valuation.

The type of scarcity should also fit the product and the buyer. "Selling fast" suits goods whose quality is hard to judge and where other people's choices carry information. "Edition of five hundred" suits goods that serve identity. Mixing the two carelessly tends to weaken both.

Credibility is the asset most easily wasted. Scarcity the buyer can check, such as a published edition size or inventory that updates in real time, is ethically cleaner and also commercially stronger, since it is costly to fake. Firms that fabricate scarcity are borrowing against future trust, and repeated or heavy-handed cues can provoke suspicion or reactance aimed at the seller. A single accurate cue at the right moment may do better than a constant stream.

In high-involvement categories such as housing, transparency matters more than pressure. Buyers who take weeks over a decision notice inconsistencies, and a doubtful claim costs more in reputation than it gains in speed.

Policymakers and platforms have a part to play as well. Clear standards separating genuine scarcity information from manufactured pressure protect consumers, and they protect honest sellers too by keeping the signal worth something. India's dark-pattern guidelines point in that direction, and their effect on both trust and sales deserves study.

11. CONCLUSION

Scarcity influences willingness to pay, but not simply or automatically. The research reviewed here suggests five channels: quality inference, uniqueness seeking, competitive arousal, loss aversion and attentional narrowing. They operate differently, depend on different features of the situation, and can pull in different directions. Quality inference and uniqueness are the most likely to support a durable premium. Competitive arousal and attentional narrowing may raise purchases without raising valuation, and may fade once the cue is gone. Loss aversion sits in between.

The effect is also conditional. Whether scarcity is driven by demand or by supply, whether it concerns quantity or time, whether the product is visible or private, whether the consumer is high or low in need for uniqueness, and above all whether the cue is believed, each changes the outcome, sometimes enough to reverse it. The size of the premium depends heavily on how willingness to pay is measured, and much of the evidence rests on outcomes that do not involve real money.

For future research, what is needed most is evidence based on real incentives, separate tests of the mechanisms, and observation of consumers over time. The propositions and design above are one way to begin. For practice the message is simpler. Where scarcity is real and honestly stated, it is information, and information has value. Where it is invented, the seller is spending trust, and given how fast consumers learn and how closely regulators now look, that seems a poor use of it.

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